



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/926,377

12/13/2001

Thomas Grassl

GRAS3003/JEK

9840

23364

7590

09/03/2004

BACON & THOMAS, PLLC
625 SLATERS LANE
FOURTH FLOOR
ALEXANDRIA, VA 22314

EXAMINER

HOGANS, DAVID L

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 09/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/926,377

Applicant(s)

GRASSL, THOMAS

Examiner

David L. Hogans

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2004.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-26 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☒ Claim(s) 25 and 26 is/are allowed.
6) ☒ Claim(s) 19-21 and 23 is/are rejected.
7) ☐ Claim(s) 22 and 24 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 23 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to the Amendment filed on June 30, 2004.

Status of Claims

Claims 19-26 are pending. Claims 1-18 are cancelled.

Claim Objections

1. Claims 24 and 26 are objected to because of the following informalities: Claim 24 line 3 and Claim 26 line 16, both refer to "the third metalization". Proper antecedent basis is lacking and appropriate correction is required.

Claim Rejections - 35 USC § 112

The previous rejections of Claims 11-18 under 35 U.S.C. § 112, first and second paragraphs, is withdrawn pursuant to the Amendments submitted by the Applicant on June 30, 2004.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 23 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 23 line 11 claims "a second circuit layer located along the second side of the first

circuit layer". The Examiner notes that the specification and disclosure teach the second circuit layer located along the second side of the first insulation layer.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. On page 6 of Applicant's remarks lines 18-19, support for Claim 21 is given. Applicant portends that active circuit components 8 extend around the connection between the first and second side vertical contacts 15 and 18. The Examiner notes that the area demarcated 8 is an oxide and not an active circuit.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claim 19, 21 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by 5,426,072 to Finnila.

In reference to Claim 19, Finnila teaches:

- providing first (12) and second (10) substrates, and a first insulation (11) layer interposed between the first and second substrates, the first substrate located on a first side of the first insulation layer and the second substrate located on a second side of the first insulation layer opposed to the first side; (See Figures 2-10 and columns 3-8 lines 01-10)

- providing the first substrate with active circuit components (transistors 18) along and within at least one portion thereof to define a first circuit layer; (See Figures 2-10 and columns 3-8 lines 01-10)
- applying a second insulation layer (20) over the first circuit layer; (See Figures 2-10 and columns 3-8 lines 01-10)
- forming at least one first gap (21) through the second insulation layer that extends at least a portion into the first circuit layer and is in communication with the active circuit components thereof; (See Figures 2-10 and columns 3-8 lines 01-10)
- filling the at least one first gap with a first metalization (21) that defines at least one first side vertical contact; (See Figures 2-10 and columns 3-8 lines 01-10)
- thinning the second substrate (10) to expose the second side of the first insulation (11) layer; (See Figures 2-10 and columns 3-8 lines 01-10)
- forming at least one second gap (28) through the first insulation layer that extends at least into a portion of the first circuit layer, the at least one second gap generally coinciding with the at least one first side vertical contact; (See Figures 2-10 and columns 3-8 lines 01-10) and
- applying a second metalization (28) along the second side of the first insulation layer, at least a portion of the second metalization extending through the at least one second gap to contact the first side vertical contact and defining a second side vertical contact (See Figures 2-10 and columns 3-8 lines 01-10)

Art Unit: 2813

In reference to Claim 21, Finnila teaches:

- wherein some of the active circuit components of the first circuit layer extend to the first insulation layer and surround the connection between the first and second side vertical contacts (See Figures 2-10 and columns 3-8 lines 01-10)

In reference to Claim 23, Finnila teaches:

- a first insulation layer having a generally planar form, and opposed first and second sides, the first insulation layer defining at least one opening extending therethrough; (See Figures 2-10 and columns 3-8 lines 01-10)
- a first circuit layer bearing a plurality of active circuit components, a first side of the first circuit layer located on the first side of the first insulation layer; (See Figures 2-10 and columns 3-8 lines 01-10)
- a second insulation layer positioned on a second side of the first circuit layer opposed to the first side thereof, said second insulation layer having at least one first side vertical contact extending therethrough and into at least a portion of the first circuit layer; (See Figures 2-10 and columns 3-8 lines 01-10) and
- a second circuit layer located along the second side of the first circuit layer and defined as a metallized layer, the second circuit layer having a second side portion extending through the at least one opening of the first insulation layer and into at least a portion of the first circuit layer so as to connect to the first side vertical contact (See Figures 2-10 and columns 3-8 lines 01-10)

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 19 and 23 rejected under 35 U.S.C. 102(e) as being anticipated by 6,104,081 to Dekker et al.

In reference to Claim 19, Dekker et al. teaches:

- providing first (4) and second substrates, and a first insulation (3) layer interposed between the first and second substrates, the first substrate located on a first side of the first insulation layer and the second substrate located on a second side of the first insulation layer opposed to the first side; (See Figures 1-6 and columns 3-5 lines 20-53)
- providing the first substrate with active circuit components (transistor 5) along and within at least one portion thereof to define a first circuit layer; (See Figures 1-6 and columns 3-5 lines 20-53)
- applying a second insulation layer (11) over the first circuit layer; (See Figures 1-6 and columns 3-5 lines 20-53)
- forming at least one first gap (12) through the second insulation layer that extends at least a portion into the first circuit layer and is in communication with

Art Unit: 2813

the active circuit components thereof; (See Figures 1-6 and columns 3-5 lines 20-53)

- filling the at least one first gap with a first metalization (14) that defines at least one first side vertical contact; (See Figures 1-6 and columns 3-5 lines 20-53)
- thinning the second substrate to expose the second side of the first insulation (3) layer; (See Figures 1-6 and columns 3-5 lines 20-53)
- forming at least one second gap (19) through the first insulation layer that extends at least into a portion of the first circuit layer, the at least one second gap generally coinciding with the at least one first side vertical contact; (See Figures 1-6 and columns 3-5 lines 20-53) and
- applying a second metalization (21) along the second side of the first insulation layer, at least a portion of the second metalization extending through the at least one second gap to contact the first side vertical contact and defining a second side vertical contact (See Figures 1-6 and columns 3-5 lines 20-53)

In reference to Claim 23, Dekker et al. teaches:

- a first insulation layer having a generally planar form, and opposed first and second sides, the first insulation layer defining at least one opening extending therethrough; (See Figures 1-6 and columns 3-5 lines 20-53)
- a first circuit layer bearing a plurality of active circuit components, a first side of the first circuit layer located on the first side of the first insulation layer; (See Figures 1-6 and columns 3-5 lines 20-53)

- a second insulation layer positioned on a second side of the first circuit layer opposed to the first side thereof, said second insulation layer having at least one first side vertical contact extending therethrough and into at least a portion of the first circuit layer; (See Figures 1-6 and columns 3-5 lines 20-53) and
- a second circuit layer located along the second side of the first circuit layer and defined as a metallized layer, the second circuit layer having a second side portion extending through the at least one opening of the first insulation layer and into at least a portion of the first circuit layer so as to connect to the first side vertical contact (See Figures 1-6 and columns 3-5 lines 20-53)

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over 5,426,072 to Finnila in view of 6,495,454 to Livengood et al.

Incorporating all arguments of Claim 19 and noting that Finnila fails to explicitly teach wherein portions of the second metalization are interrupted at locations corresponding to the at least one first side vertical contact.

However, Livengood et al., in Figures 3 and 4 and columns 6-7 lines 10-56, teaches wherein portions of the second metalization (326 or 410) are interrupted at locations corresponding to the at least one first side vertical contact (316, 318 or 421b).

It would have been obvious to one of ordinary skill in the art to modify Finnila by incorporating wherein portions of the second metalization are interrupted at locations corresponding to the at least one first side vertical contact, as taught by Livengood et al., to different interconnects within an integrated circuit.

Allowable Subject Matter

6. Claims 22 and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
7. Claims 25 and 26 are allowable.
8. The following is a statement of reasons for the indication of allowable subject matter.

The prior art of record fails to teach or suggest, in combination with the other claimed features, an annular metalization extending through the second insulation layer and into at least a portion of the first circuit layer, the third metalization annularly surrounding the first side vertical contact with at least a portion of the active circuit components interposed therebetween.

Response to Arguments

9. Applicant's arguments with respect to newly submitted claims 19-26 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David L. Hogans whose telephone number is (571) 272-1691. The examiner can normally be reached on M-F (7:30-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on (571) 272-1702. The fax phone

Art Unit: 2813

number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DH 

